25X1

CONFIDENTIAL

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April 14, 1959

Dear Sir:

This is the first letter report under Task Order No. FF, and it summarizes the research performed during February and March, 1959.

The aims of this program are (1) to determine the performance capability of the present system, 25X1 and (2) to make any modifications required in order to obtain optimum performance and reliability. The general procedure to be used in this program is as follows:

(1) Each component will be tested separately to determine its long-term stability, performance characteristics, and reliability under various environmental conditions.

(2) If these tests so indicate, modifications will be made to provide proper performance.

(3) The system will then be tested in its entirety to determine over-all performance.

(4) Any further necessary modifications will be made.

(5) Capability tests will then be conducted to determine the reliability of the system as a function of range through various media. Operational methods for providing optimum performance will be determined in the course of conducting these tests.

The work to date has involved investigation of the decoder and transducer performance. Tests were conducted to determine decoder stability during an 8-hour period of continuous operation and on a day-to-day basis over a period of one week. Ambient temperatures encountered during these tests ranged from 65 to 80 F. This range will be extended to include higher temperatures. In all of the tests conducted thus far, decoder stability was found to be satisfactory. However, two factors which may affect the long-term stability have been observed since we placed the decoder in operation. These are excessive heating of the commutator-switch motor and slight variations in the reset-circuit performance over relatively long periods of time. Modifications to eliminate these conditions will be made prior to conducting a long-term reliability test.

In some of the previous tests, the transducer has proven to be one of the more troublesome components in the system. For this reason, it seems desirable to scrutinize thoroughly the design and construction of the transducer and its application to the over-all system. Such work has been started during this research period.

Plans for next month include replacement of the commutator-switch motor and modifications of the reset circuit, along with a continuation of the transducer work. Further familiarization with the transmitter and pulse-converter operation will start when the circuit diagrams for these devices become available.

The original appropriation on this Task Order was $21,179. As of April 1, 1959, the unexpended balance was approximately $17,700.

Sincerely,

[redacted] 25X1

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In Duplicate